

Museum Smithsonian, No. 6589. Received from Mirador, near Vera Cruz, from Dr. Charles Sartorius.

This species is near the *Sc. grammicus* Wiegmann, *Herpetologia Mexicana*, the type of which I consider to be sp. No. 641, Mus. Berolinense. In it there are but 38 rows of dorsal scales, three rows of supraorbitals, and no auricular marginal series.

BATRACHIA.

Lithodytes rhodopis sp. nov.

Near the *L. griseus* (Hallow.) of the same region, but of a more elongate form; the head narrower with smaller orbits and larger membranum tympani; toes more elongate, and with smaller dilatations; there are peculiar dorsal folds; the groin and femur are also not marbled as in the *L. griseus*.

Greatest breadth cranium one and two-fifth times between tympanum and end coccyx, equal between former and end of muzzle. Diameter of orbit equal from same to exterior nares, 1.5 times to equal longest or vertical diameter of tympanum (2 to 2.5 in *L. griseus*;) largest in young individuals. Vomerine series transverse, posterior well separated, not extending outside of line of interior margin of nares. Canthus rostralis well marked. A plica from posterior angle of eye extends to the anterior dorsal region nearly meeting its fellow; nearly opposite their termini a dorso lateral fold originates and passes to the line of the ilia; a third extends from over tympanum to near groin: generally minutely rugose above. Heel to considerably beyond muzzle. Sole and fourth digit, 1.3 to 1.5 width of cranium; metatarsals with series of small tubercles, and with a distinct inner euneiform process; a slight web between proximal phalanges. Anterior digits without dilatations. End of forearm to end of muzzle. End muzzle to end coccyx 1 in. 7 lin. Same to posterior margin tympanum 7.5 lines. Hinder limb from end ilium to heel 1 in. 7.5 lin., foot 1 in. 4 lin.

Above dark gray, shaded with pink; a darker pale edged bar between ocular fissures, a longitudinal blotch of the same on top of muzzle; back with indistinct darker markings. Side of muzzle and head in spots on labial margin and cross-bands on limbs with sole of whole foot darker; a decurved black line from nostril over tympanum above humerus. Concealed faces of limbs and margin of mandible brown punctulate; below generally yellowish white. In another specimen there is no interorbital cross-bands, but two longitudinal stripes from muzzle to nape, and two from orbits converging on coccyx, and embracing a dark shade. Young, clay color with pink shades to rose color.

Habitat.—Vera Cruz, at Orizava and Cordova. Prof. Sumichrast's Collection.

On the Agricultural Ant of Texas. (*MYRMICA MOLEFACIENS*.)

BY GIDEON LINCECUM.

This is No. 2 of my catalogue—is inodorous, having no smell of formic acid. It is a large reddish brown ant, dwells in the ground, is a farmer, lives in communities, which are often very populous, and controlled by a perfect government; there are no idlers amongst them. They build paved cities, construct roads, and sustain a large military force.

When one of the young queens, or mother ants, comes to maturity, and has received the embraces of the male ant, who immediately dies, she goes out alone, selects a location and goes rapidly to work excavating a hole in the ground, digging and carrying out the dirt with her mouth. As soon as she has progressed far enough for her wings to strike against the sides of the hole, she deliberately cuts them off. She now, without further obstruction, continues to deepen the hole to the depth of 6 or 7 inches, when she widens the

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bottom of it into a suitable cell for depositing her eggs and nurturing the young. She continues to labor out-doors and in, until she has raised to maturity 20 to 30 workers, when her labor ceases, and she remains in the cells, supplying the eggs for coming millions, and her kingdom has commenced. But very few of the thousands of mother ants that swarm out from the different kingdoms two or three times a year succeed in establishing a city. However, when one does succeed in rearing a sufficient number of workers to carry on the business, she entrusts the management of the national works to them, and is seen no more outside.

The workers all seem to understand the duties assigned to them, and will perform them or die in the effort.

The workers increase the concealment, which had been kept up by the mother ant during the period of her personal labors, of the passage, or gateway to their city, by dragging up and covering it with bits of stick, straw and the hard black pellets of earth, which are thrown up by the earth worms, until there is no way visible for them to enter; and the little litter is so ingeniously placed, that it has more the appearance of having been drifted together by the wind than to have been the work of design.

In about a year and a half, when the numbers of the community have greatly increased, and they feel able to sustain themselves among the surrounding nations, they throw off their concealment, clear away the grass, herbage and other litter to the distance of 3 or 4 feet around the entrance to their city, construct a pavement, organize an efficient police, and, thus established, proclaim themselves an independent city. The pavement, which is always kept very clean, consists of a pretty hard crust about half an inch thick, and is formed by selecting and laying such grits and particles of sand as will fit closely over the entire surface. This is the case in sandy soil, where they can procure coarse sand and grit for the purpose, but in the black prairie soil, where there is no sand, they construct the pavement by levelling and smoothing the surface and suffering it to bake in the sunshine, when it becomes very hard and firm. That both forms of these pavements are the work of a well planned design, there can be no doubt with the careful investigator. All the communities of this species select their homes in the open sunshine, and construct pavements. Their pavements are always circular and constructed pretty much on the same plan. During the ten years drouth that prevailed here, and which seemed very favorable to the increase of this species of ant, they suffered their pavements to remain flat, sometimes even basin-form. But the drouth could not continue always. The rain, which would be certain to drown the ants should it come upon their flat and basin-form pavements, would return again some day, and they seemed to know when this much dreaded event would occur. At least six months previous to the coming of the rain, they commenced, universally, building up mounds in the center of the pavements. To these mounds in the prairie they brought the little pellets of earth, thrown to the surface by the earth worms, and piled them up into a circular mound a foot or more in height. In sandy soil it is constructed of coarse sand, and in rocky situations they build it of gravel, and the pieces are so large, and the mound so high (18 inches to 2 feet, with a four feet base) that the beholder is overwhelmed with wonder. I know of one of these stone pyramids nearly 3 feet high and $5\frac{1}{2}$ to 6 feet base, in which there are many little fragments of stone, some of them carried to the very top, any one of which would weigh more than 25 ants. Internally the ant mound contains many neatly constructed cells, the floors of which are horizontal; and into these cells the eggs, young ones, and their stores of grain are carried in time of rainy seasons.

The mound itself, and the surface of the ground around it, to the distance of four or five feet, sometimes more, from the center, is kept very clean, like a pavement. Everything that happens to be dropped upon the pavement is cut to pieces and carried away. The largest dropping from the cows will, in a short time, be removed. I have placed a large corn-stalk on the pavement,

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and in the course of two or three days found it hollowed out to a mere shell ; that too, in a short time, would be cut to pieces and carried off. Not a green thing is suffered to grow on the pavement, with the exception of a single species of grain-bearing grass, (*Aristida stricta*.) This the ant nurses and cultivates with great care ; having it in a circle around and two or three feet from the center of the mound. It also clears away the weeds and other grasses all around outside of the circular row of *Aristida*, to the distance of one or two feet. The cultivated grass flourishes luxuriantly, producing a heavy crop of small, white, flinty grains, which, under the microscope, have the appearance of the rice of commerce. When it is ripe it is harvested by the workers, and carried, chaff and all, into the granary cells, where it is divested of the chaff, which is immediately taken out and thrown beyond the limits of the pavement always to the lee side. The clean grain is carefully stored away in dry cells. These cells are so constructed that water cannot reach them, except in long wet spells, when the earth becomes thoroughly saturated, and dissolves the cement with which the granary cells are made tight. This is a great calamity, and if rain continues a few days it will drown out the entire community. In cases, however, where it has continued long enough only to wet and swell their grain, as soon as a sunny day occurs they take it all out, and spreading it in a clean place, after it has sunned a day or two, or is fully dry, they take it in again, except the grains that are sprouted ; these they invariably leave out. I have seen at least a quart of sprouted seeds left out at one place.

They also collect the grain from several other species of grass, as well as seed from many kinds of herbaceous plants. They like almost any kind of seeds—red pepper seeds seem to be a favorite with them.

In a barren rocky place in a wheat field, a few days after harvest, I saw quite a number of wheat grains scattered over the pavement of an ant city, and the laborers were still bringing it out. I found the wheat quite sound, but a little swelled. In the evening of the same day I passed there again ; the wheat had dried, and they were busily engaged carrying it in again.

The species of grass they so carefully cultivate is a biennial. They sow it in time for the autumnal rains to bring it up. Accordingly, about the first of November, if the fall has been seasonable, a beautiful green row of the *ant rice*, about 4 inches wide, is seen springing up on the pavement, in a circle of 14 to 15 feet in circumference. In the vicinity of this circular row of grass they do not permit a single spire of any other grass or weed to remain a day ; leaving the *Aristida* untouched until it is ripe, which occurs in June of the next year they gather the seeds and carry them into the granaries as before stated. There can be no doubt of the fact that this peculiar species of grass is intentionally planted, and, in farmer-like manner, carefully divested of all other grasses and weeds during the time of its growth, and that after it has matured, and the grain stored away, they cut away the dry stubble and remove it from the pavement, leaving it unencumbered until the ensuing autumn, when the same species of grass, and in the same circle, appears again, receiving the same agricultural care as did the previous crop ; and so on, year after year, as I know to be the case on farms where there habitations are, during the summer season, protected from the depredations of cattle. Outside of the fields they sow the grass seeds, but the cows crop it down two or three times, when, finding that there is no chance to carry on their agricultural pursuits, they cut it all away and re-establish the clean pavement. Our cattle did not often crop the *ant rice* until their increased numbers have forced them to feed on all kinds of grass. That, however, has turned out favorably to the ant interest. For, while the prairies are being denuded of the stronger grasses, we have a delicate little biennial barley (*Hordium pusillum*) that is filling all the naked places. It rises from 3 to 6 inches, producing fine grain for ant consumption. It matures about the last days of April, and from that time all the agricultural ants are seen packing it home daily through the summer. This species of ant
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subsists entirely on vegetable seeds. I have sometimes seen them drag a caterpillar or a crippled grasshopper into their hole, that had been thrown upon the pavement, but I have never observed them carrying any such things home that they had captured themselves. I do not think they eat much animal food.

I have often seen them have prisoners, always of their own species. I could not discover the nature of the offence that led to the arrestment; still I have no doubt as to the fact of its being so, and that the prisoner is very roughly forced along contrary to its inclination. There is never more than a single guard having charge of a prisoner, who by some means having obtained the advantage, and attacking from behind, had succeeded in seizing it with the mandibles over the smallest part of its back, and so long as it maintains this grip, it is out of the reach of harm from the prisoner.

In some cases the prisoner quietly submits, and folding up its legs, forces the captor to carry it along like a dead ant, as I thought it really was, until I caused its captor to drop it; when, to my surprise, it immediately sprang to its feet, and, running wildly, succeeded in making its escape. It occurs more frequently, however, that the prisoner does not give up so tamely, but continues to make every effort to rid itself of its detainer. I have many times observed the prisoner manifesting all the indications of terror and great reluctance at being so unceremoniously dragged along. It will lay hold of and cling to everything that comes in reach, and by this means greatly retard the progress of its captor. When at last they arrive on the city pavement, half a dozen or more of the national guard, who are always on duty, rush upon the prisoner, aiding the seemingly fatigued captor, who still maintains its potent grip upon the now almost helpless prisoner, seize it by the arms, legs, everywhere, and in a very rough manner hurry it down into the entrance to the city, and out of the reach of further observation.

The agricultural ant is very tenacious of life. I dismembered the head of one at 4 P. M. on Sunday, and the head remained alive, retaining sufficient strength by pressing with its antennæ against the slip of glass upon which it lay to move itself and change its position, until 10 A. M. the next day.

It seems to be an established law amongst all species of ants, and particularly with the species in question, that when any disaster occurs to their city, the first thing to be done is to take care of the young, and, if possible, secure their safety; and so, when by any accident one of their cities gets torn up, it will be seen that they universally rush to the nursery apartment; and every one that can, takes up an egg, the pupæ, the young in any stage of advancement, and will save its life or lose its own. As far as I can understand and read their actions, every one understands its duty, and will do it or lose its life. I have observed the guards, when a sudden shower of rain would come up, run to the entrance of the city, and there meeting with another party coming up from below, would crowd themselves together in the hole in such manner as to form a complete obstruction to the ingress of the water, and there remain overwhelmed with the accumulating rain until it ceased. If the shower continues over fifteen minutes, they are found to be still closely wedged in the aperture and all dead; and there they remain until the balance of the pavement guards, who during the shower had climbed some weed or blade of grass that grew near the border of the pavement, come down, and with some difficulty succeed in taking them out. They are immediately taken to some dry place on the pavement and exposed to the open air half an hour at least; after which, if they do not revive, they are taken off from the pavement, sometimes to the distance of sixty yards, and left on the ground without further care.

Long-continued rainy seasons, by deeply saturating the earth, will dissolve the cement of their cells, flood them, and drown the ants out entirely. I have allusion now only to the agricultural species of the genus. The first year after my arrival in Texas, I noticed that there were a great many uninhabited ant

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hills, with pavements still smooth and nude of grass or weeds, indicating that they had been very recently occupied. The missing communities were all dead—extinct—had been destroyed by a series of rainy seasons. Then, there were but few of these ant cities to be found that were occupied. But when the drouth set in, the earth being no longer filled with water, they began to multiply very rapidly. City after city appeared as the dry weather continued, and now, 1863, at the close of a ten years' drouth, they have spread so extensively, that their clean little paved cities are to be seen every fifty or sixty yards, especially along the roadsides, in the prairies, walks in yards and fields, barren rocky places, &c. In beds of heavy grass, or weeds, or in deep shady woodlands, they very seldom locate a city. They prefer sunshine and a clear sky. This ant does not work in the heat of the day during hot weather, but makes up the lost time during the night. I have often found them busily engaged at 2 and even 3 o'clock, A. M. Before day, however, they call off the workers, and rest till about sunrise. In more favorable weather, when they can operate all day, they do not work late at night.

In regard to courage, there can be no mistake in stating, that when the interests of the nation are involved, this ant exhibits no signs of fear or dread of any consequences that may result to self, while engaged in the discharge of its duties.

The police or national guards of a community which has been established three or four years, number in the aggregate, of the parties on duty, from one to two hundred. These are seen all the time, in suitable weather, uneasily promenading the environs of the city. If an observer takes his stand near the edge of the pavement, he will discover an instantaneous movement in the entire police corps, coming wave-like towards him. If the observer imprudently keeps his position, he will soon see numbers of them at his feet, and without the slightest degree of precaution, or the least hesitation, they climb up his boots, on his clothes, and as soon as they come to anything that they can bite or sting, whether it be boot, or cloth, or skin, they go right to work biting and stinging; and very often, if they get good hold on any soft texture, they will suffer themselves to be torn to pieces before they will relinquish it. If they succeed in getting to the bare skin, they inflict a painful wound, the irritation, swelling and soreness of which will not subside in twenty-four hours.

If any worm or small bug shall attempt to travel across their pavement, it is immediately arrested, and soon covered with the fearless warriors, who in a short time deprive it of life. Woe unto any luckless wight of a tumble-bug who may attempt to roll his spherical treasure upon that sacred and forbidden pavement. As soon as the dark, execrable globe of unholy material is discovered by the police to be rolling on, and contaminating the interdicted grounds, they rush with one accord upon the vile intruder, and instantly seizing him by every leg and foot, dispatch him in a short time. Sometimes the tumble-bug takes the alarm at the start, while only two or three of the ants have hold on it, expands its wings and flies off with them hanging to its legs. If it fails to make this early effort, it very soon falls a victim to the exasperated soldiery. The ball of filth is left on the pavement, sometimes in the very entrance to the city. In due time the workers take possession of it, cut it into fragments, and pack it off beyond the limits of the incorporated grounds.

I have not observed that anything preys to any considerable extent upon this species of ant. Chickens and mocking birds will sometimes pick up a few of them, but not often. If anything else in Texas eats them, I have not noticed it. Neither have I observed their nests bored into or dug up in middle Texas.

The agricultural ant is of but little disadvantage to the farmer, however numerous, as it is never seen six inches from the ground, nor does it cut or trouble any growing vegetable outside of its pavement, except the seeds of the noxious weeds and grasses. Sometimes it is found stealing corn meal, broom-corn seeds, &c.; but it is only when it finds them on the ground that it steals even these.

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Children occasionally get on their pavement, and are badly stung. A few of these pavement lessons, however, generally obviate that inconvenience. The pain of their poison is more lasting, will swell and feel harder, than that of the honey bee. If they insert their stings on the feet or ankles of the child, the irritation will ascend to the glands of the inguinal region, producing tumours of a character quite painful, often exciting considerable fever in the general system; the irritation will last a day or two, but I have seen no permanent injury arising from it.

During protracted spells of dry weather, they are frequently found in great numbers in our wells. They seem to have gone there in pursuit of water, and not being able to get back, to make the best of a bad condition—in this unforeseen dilemma—they will collect and cling together in masses as large as an ordinary teacup, in which condition they are frequently caught and drawn up in the bucket. When they are thus brought up, though they may have been in the water a day or more, they are all living, though half-drowned and barely able to move. While in the well they are all afloat, and at least one-half the mass submerged. As it is known that this species of ant cannot survive 15 minutes under water, how they manage when in a large half-sunken mass to survive a day, or even longer, is a question to which I may fail to give a satisfactory solution. I may, however, from experiments I have made with single individuals, in water, venture the assertion that there is no possible chance for the submerged portion of the globular mass, if it remain in the same condition in relation to the water, to survive even half an hour. Then we are forced to the supposition that by some means or other the ball must be caused to revolve as it floats. The globular mass must be kept rolling, and make a revolution every four *minutes*, or the submerged portion must die. To accomplish this somewhat astonishing life-preserving process, there is but one possible alternative. It can be effected only by a united and properly directed systematic motion of the disengaged limbs of the outer tier of ants, occupying the submerged half of the globular mass.

I saw to-day (June 15), in a clean-trodden path near my dwelling, quite a number of this species of ant engaged in deadly conflict. They were strewed along the path to the distance of 10 or 12 feet, fighting, most of them, in single combat. In some few cases, I noticed there would be two to one engaged, in all of which cases the struggle was soon ended. Their mode of warfare is decapitation, and in all cases where there were two to one engaged the work of cutting off the head was soon accomplished. There were already a number of heads and headless ants laying around, and there was a greater number of single pairs of the insatiate warriors grappling each other by the throat on the battle-field, some of whom seemed to be already dead, still clinging together by their throats. Among the single pairs in the deadly strife there were no cases of decapitation. They mutually grapple each other by the throat, and there cling until death ends the conflict, but does not separate them. I do not think that in single combat they possess the power to dis sever the head; but they can grip the neck so firmly as to stop circulation, and hold on until death ensues without their unlocking the jaws even then.

The cause of this war was attributable to the settlement of a young queen in close proximity (not more than 20 feet) of a very populous community that had occupied that scope of territory for ten or twelve years. At first, and so long as they operated under concealment, the old community did not molest them; but when they threw off their mask, and commenced paving their city, the older occupants of that district of territory declared war against them and waged it to extermination. The war was declared by the old settlers, and the object was to drive out the new ones or exterminate them. But the warriors of this species of ant are not to be driven. Where they select a location for a home, nothing but annihilation can get them away. So, in the present case, the war continued two days and nights, and resulted in the total extermination of the intruding colony. From the vastly superior numbers of the older

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settlers, though many of them were slain during the war, they nevertheless succeeded in destroying the entire colony, without any apparent disturbance or unusual excitement about the great city. Their national works and governmental affairs went on in their ordinary course, while the work of death was being accomplished by their resolute bands of triumphant warriors.

They do not interrupt, in any way that I have discovered, the small black erratic ant, when it comes on their pavement. They even permit the erratic ants to erect cities on any portion of the incorporated limits, and do not molest them. It may be that the little fellows serve them some purpose. But when they build too many of their confederate cities on the pavement of the agricultural ant, it seems to be an inconvenience to them some way, but they do not go to war with them, nor attempt to rid themselves of the inconvenience by any forcible means. They, however, do get clear of them, and that by instituting a regular system of deceptive and vexatious obstructions. The deception is manifested in the fact that it appears to have suddenly become necessary to raise the mound two or three inches higher, and also to widen the base considerably. Forthwith are seen swarming out upon the pavement hosts of ants, who go rapidly to work, and bringing the little black balls which are thrown up by the earthworms in great quantities everywhere in the prairie soil, they heap them up, first at the base of the mound, widening till all the near erratic ant cities are covered up. At the same time, they raise the entire pavement an inch or so, and in prosecuting this part of the national work deposit abundantly more balls upon and around the erratic ant cities than anywhere else. The little ants bore upwards through the hard sun-dried balls, which are constantly accumulating—getting worse every hour—until the obstruction has become so great that they can no longer keep their cities open; and, finding that there is no remedy for the growing difficulty, they peaceably evacuate the premises. There is found on almost every pavement, at this season of the year, three or four small pyramidal mounds, that have been constructed for the purpose of crowding out the little erratic ants.

The extensive, clean, smooth roads that are constructed by the agricultural ants are worthy of being noticed. At this season of the year their roads are plainest and in the best order, because it is harvest time, and their whole force is out collecting grain for winter supplies.

I am just this moment in from a survey of one of these roads, that I might be able to make an exact and correct statement of it. It is over a hundred yards in length, goes through twenty yards of thick weeds, underruns heavy beds of erop grass 60 yards, and then through the weeds growing in the locks of a heavy rail fence 20 yards more; and throughout the whole extent it is very smooth and even, varying from a straight line enough, perhaps, to lose 10 or 12 yards of the distance in travelling to the outer terminus. It is from 2 to 2½ inches wide; in some places, on account of insurmountable obstructions, it separates into two or three trails of an inch in width, coming together again after passing the obstruction. This is the main trunk, and it does not branch until it crosses the before-named fence, beyond which is a heavy bed of grain bearing weeds and grass. Their prospecting corps travel far out, and when they discover rich districts of their proper food they report it, and a corps of foragers are immediately dispatched to collect and bring it in.

27th June, 1863.—My son, Dr. Leonidas, called my attention to an assemblage of the males and females of the agricultural ants (*Myrmica molefaciens*) which took place about 2 P. M., and continued in session until 4 P. M. They were all winged ants, and there were many thousands, perhaps millions, of them, thickly covering the ground over an area of 107 yards in length and 10 wide. They came from all directions, and were evidently the production of many kingdoms of this wonderful species of ant. There must have been, at least, five males to one female, and all parties were rushing hither and thither over the entire area, described above, in a frantic, amative furor. Each female would be found covered and wallowing on the ground with clusters of from 1866.]

four or five to twenty males; and there were hundreds thickly rushing over the ground in search of females that were not to be found. The air was full of them flying around, going off and returning; some of them, perhaps, just arriving.

When a female became satisfied with her numerous lovers, by a great and violent effort she made shift to extricate herself from their rude embrace and immediately fly away. After 4 P. M. they began rapidly to fly away, and in the course of an hour they were all gone, leaving their disconsolate, exhausted lovers, who made no effort to follow. Many of the males were already dead, and a still greater number lay helpless on the ground; but there were hundreds of thousands who were still active, and they collected together in the horse-tracks, cracks in the ground, and other places sheltered from the south wind, which prevails at that season of the year, and becoming perfectly quiet, were, at 6 P. M., lying still in heaps of from half a pint to a quart, sometimes more. At this hour I examined the entire field, and there must have been very near, if not quite, a bushel of the exhausted and dying male ants.

A strong south wind was blowing during the time the females were flying off, and the larger portion of them were drifted by the wind into the timbered lands to the north; many of them, however, succeeded in forcing their way a few hundred yards against the wind, and alighting, which seemed to be the effect of fatigue more than desire, they immediately, by writhing and doubling themselves in various ways, cast off their wings, which were no longer necessary, and running rapidly till they found a little clean spot of earth, went hurriedly to work digging holes in the ground, which they accomplished with apparent ease and considerable facility. They dig and bring out the dirt in considerable pellets with their large caliper-like mandibles, carrying it not exceeding two inches and dropping it in a circle around the hole they are making; very soon they had buried themselves out of sight. Two hours after they had commenced flying away from their lovers, hundreds of holes, with a little circle of black dirt around them, might be seen. In every clean-trodden piece of ground, and in the roads and paths, these new tenements were thickly set long before sundown.

Only one of these mother ants is necessary to start a kingdom. I saw no instance where two of them were at work at the same hole. In some favorable spot of ground there would be found a great many of them at work excavating their holes, sometimes within a foot of each other. None seemed to know that any other ant was near. While one was out with a load of dirt, I placed a stick in her hole; returning, she did not know the place, and in searching around soon found another one's hole, into which she immediately plunged. Very soon the owner of the establishment pushed the intruder out, who made battle as soon as they were fairly out on level ground. The conflict soon became desperate, and after they had fought for the space of a minute or two the intruder seemed to give way, and, extricating herself from her highly incensed antagonist, plunged into the hole again; the owner followed, and after some time succeeded in dragging the invader out once more; and also, after a dire conflict, in putting her to flight. The victor went to work again, but in the fight she had been injured, as I noticed every time she came out with a load of dirt she would stop awhile, and with one of her feet rub and fix something about her mouth. She seemed to be in pain, and did not work so vigorously as before the fight.

It would not do for many of these new queens to prove successful in building up kingdoms. There is some antagonistic action to prevent it. The male and female congress, I have attempted to describe above, happens two or three times every year, and should all the queens succeed in establishing colonies, they would in a very few years occupy the entire surface of the earth.

This species of ant—and I think it obtains with the whole genus, like the hornet, wasp, yellow jacket, &c.—do not go off from the old hive in swarms like the bee, but a single mother ant, after congress with the males, goes off alone and sets up for herself. She works very busily until she has raised 20 or 30 neuters

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to work for her, when she ceases to labor, and, remaining in-doors, lays all the eggs that produce the coming millions. The laborers are long-lived, so are the queens.

28th.—I extract from my journal: This morning I found the males where I left them last evening. The greater portion of them were still active, and seemed to be quite careless as to their fate. Hundreds were dead or dying. Great numbers had climbed up the little weeds, many of whom were dead, but still clinging by their jaws, which were fast gripped to some little leaf or twig. The females had buried themselves by the time it was dark last night, and, closing up their holes, remained shut in all night. But few of them had opened their doors and gone to work at an hour by sun this morning. The number of their holes is truly wonderful. I saw many places where there were at least fifty of their holes to the square rod, and northwardly they extended for miles. When these mother ants succeed in boring their holes to the depth of six or seven inches they close them up, and employ themselves widening the bottom of them a little, forming small cells for the purpose, as I suppose, of making room for the deposition of their eggs. They do not, as I can discover, need any food yet. At 5 P. M. of this day I visited the place again, and found the male ants all dead. They were drifted into the gullies by the winds into heaps, and thousands of them besides lay scattered over the ground. Some of the females were still engaged deepening their holes, and their little piles of black dirt were to be seen everywhere.

29th July.—A month has passed. I went round to-day and found that, in all those thousands of female ants, who made so brave a start excavating new homes, there was but one that was a success, and it was concealed with a little pile of trash. There may be more, but I did not find them, and the winds have swept away their little piles of dirt, so that there are no signs of them left. From some cause they are all gone. Eight or ten days after they had shut up their holes I dug up quite a number of them; found them looking well, but they had no eggs or anything else in the little cell. They seemed to be sleeping.

I have never witnessed similar assemblages in any other species of ant, though I have seen it often take place with the agricultural species.

Long Point, Texas, Oct., 1866.

Descriptions of some new species of Diurnal LEPIDOPTERA.

SERIES II.

BY TRYON REAKIRT.

26. NEONYMPHA LUPITA, nov. sp.

Female. Upper surface uniform dull brown, with a narrow, double, darker brown, marginal line.

Underneath paler; three narrow terminal lines on both wings, of which the interior is the broadest, and most clearly defined; a minute black ocellus near the apex of the primaries, ringed with pale brown; three transverse brown stripes on the same, between the middle and base; two extending from the costa to the inner margin, while the third and central one stretches over only one-third this distance.

Secondaries with three submarginal ocelli, black, encircled with yellowish brown, one near their apex, and the others close together, above the anal angle; three indistinct transverse lines above the middle, with several shorter ones towards the base. Expanse 1.25 inches.

Body of the same dull tint; antennæ ferruginous.

Hab.—"Mexico, near Vera Cruz." Wm. H. Edwards.

Orizaba. (Coll. Tryon Reakirt.)

27. PAPILIO ASTEROIDES, nov. sp.

Male. Upper surface black, marked nearly as in *Asterius*; the inner yellow 1866.]